**Amendments to the Specification:**

**Please replace title with the following amended title:**

COLOUR SENSING APPARATUS AND METHOD INCLUDING LEDS AS SENSORS

**Please replace page 2, lines 14-23, with the following amended paragraph:**

The photo-sensitive devices are LEDs. LEDs are designed to emit in a narrow wave band. This ~~may~~ can be achieved in part by the composition of the semi-conductor device which ~~provides~~ has a relatively narrow range of band gaps of predetermined energy which in turn causes the emission of photons of particular wavelengths. This ~~may~~ can also be achieved or enhanced by including colour filters in the LED package. However, by effectively using an LED in reverse by sensing current in the LED connecting leads when light is incident on the diode junction, a relatively cheap, readily available and highly effective narrowband photosensor is obtained. Furthermore, by illuminating a sample with narrow wavelength ranges of light and sensing in narrow wavelength ranges, the effects of fluorescence are mitigated.

**Please replace page 2, lines 25-28, with the following amended paragraph:**

More preferably, the LEDs ~~may~~ can be used at different times, both in light emitting and light sensing modes. By sequentially switching the LEDs between modes, a combination of different colour illuminant sources and different colour photo sensors ~~may~~ can be used to further cross check and self-calibrate the results.

**Please replace page 3, lines 1-5, with the following amended paragraph:**

By combining this invention with the ideas of the first aspect above, it is possible to produce many combinations of incident and reflected light sensing, for example by using three LEDs of each colour at different angles and using each of the three in turn as an illuminant and for sensing reflected light using the other two of the set of three and/or additionally differently coloured LEDs.

**Please replace page 4, line 15, with the following amended paragraph:**

**Detailed description of the drawings ~~preferred embodiments~~**

**Please replace page 5, lines 5-11, with the following amended paragraph:**

A ~~An alternative~~ configuration that avoids many of the problems of the above noted prior art is shown in Figure 3. In this configuration a plurality of narrow band sensors 20 are arrayed to receive reflected light from a portion of a sample 22. Optionally also, relatively narrow band illumination sources 24 may be provided to illuminate the sample 22. With reference also to Figure 2, it will be noted that the response characteristics of the sensors 20 are chosen not only to be relatively narrow band but also to overlap with at least one of its spectrally adjacent sensors.

**Please replace page 6, lines 8-15, with the following amended paragraph:**

Thus, as long as the individual response curves of each sensor ~~is~~ are known (and the emission curve of the optional LED emitter is known) by solving simultaneous equations in the way set out above, it is possible to derive precise and self-calibrated measurements for narrow bands much narrower than the narrow band response of the sensors themselves. By using additional

differing sensors and/or emitters, further measurements ~~may~~ can be taken which may be used to narrow the sensing bands even further or to provide additional cross-checks and therefore self-calibration capability.

**Please replace page 7, lines 5-19, with the following amended paragraph:**

Having realised, and as described in part above, that LEDs may be used conveniently both as light sources and light sensors, a compact and robust sensing head may be produced. In Figure 7, a generally hemi-spherical housing (although this could be some other shape) 50 is shown. Three LEDs $\alpha$, $\beta$ and $\gamma$ are shown in section which are used in sequence to illuminate and sense a sample 60. With reference also to Figure 6, it will be noted that the sensing head has a plurality of LEDs arrayed around the housing 50. Using each of these LEDs or a subset of these LEDs as sensors whilst illuminating with one or perhaps more than one LED, and applying the narrow band sensing technique described above, produces accurate measurements at many combinations of illuminant and sensing angles. This overcomes the problems of fluorescence and surface texture described above in connection with Figure 5. Furthermore, using the techniques described above in connection with Figure 2, it is possible to detect fluorescence by sensing energy in bands for sensors at particular angles which is not sensed at other angles. This may be simply flagged and/or quantified.